Registered No. HSE-49/2016





ఆంధ్రప్రదేశ్ రాజపత్రము

THE ANDHRA PRADESH GAZETTE

PUBLISHED BY AUTHORITY

PART I EXTRAORDINARY

No.519 AMARAVATI, MONDAY , AUGUST 21, 2017 **G.477**

NOTIFICATIONS BY GOVERNMENT

--x--

ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION

"APERC FORECASTING, SCHEDULING AND DEVIATION SETTLEMENT OF SOLAR AND WIND GENERATION REGULATION, 2017" (REGULATION No. 4 OF 2017).

NOTIFICATION

Lr.No. APERC/Secy/F.No.S-19/2017, Dated: 19-08-2017

In exercise of the powers conferred under sub-section (3) of Section 32, sub-section (4) of Section 33, clause (h) of sub-section (1) of Section 86 and clauses (g) and (zp) of sub-section (2) of Section 181 of the Electricity Act, 2003, (Central Act 36 of 2003) and all other powers hereunto enabling and after previous publication, the Andhra Pradesh Electricity Regulatory Commission hereby makes the following Regulation, namely:

1. SHORT TITLE AND COMMENCEMENT

1.1 This Regulation may be called the Andhra Pradesh Electricity Regulatory Commission Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation Regulation, 2017.

1.2 This Regulation shall come into force with effect from the twenty first (21st) day of August, 2017:

Provided that Forecasting, Scheduling and Deviation settlement in accordance with this Regulation shall commence from the first (1st) day of January, 2018, while the levy and collection of deviation charges shall commence from the first (1st) day of July, 2018.

2. DEFINITIONS AND INTERPRETATION

2.1 In this Regulation, unless the context otherwise requires,-

(a) **'Absolute Error'** means the absolute value of the error in the actual injection of wind or solar generators with reference to the scheduled generation and the 'Available Capacity' (AvC), as calculated using the following formula for each fifteen (15) minute time block:

Absolute Error (%) = 100 X [Actual Injection – Scheduled Generation] / (AvC) ;

(b) **'Act'** means the Electricity Act, 2003 (Central Act 36 of 2003);

(c) **'actual injection'** in a time-block means electricity generated or supplied by the seller, as the case may be, measured by the Interface meter;

(d) **'APTRANSCO'** means the Transmission Corporation of Andhra Pradesh Limited having transmission license granted under Section 14 of the Act, to transmit electricity in the State;

(e) **'Available Capacity or AvC'** means for a wind generating station, the cumulative capacity rating of wind turbines that are capable of generating power in a given time-block and for a solar generating station, the cumulative capacity rating of solar inverters that are capable of inverting power in a given time-block;

(f) '**beneficiary**' means a person procuring electricity generated from a Solar or Wind generating station including solar / wind captive generating station;

(g) **'buyer'** means a person, including a beneficiary purchasing electricity from a Solar or Wind generating station through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access, as the case may be;

(h) **'CERC'** means the Central Electricity Regulatory Commission referred to in sub-section (1) of section 76 of the Act;

(i) **'Commission'** means the Andhra Pradesh Electricity Regulatory Commission constituted under sub-section (1) of Section 82 of the Act;

(j) **'deviation'** in a time-block for a seller means its total actual injection minus its total scheduled generation;

(k) **'DISCOM'** means either the Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL) or the Southern Power Distribution Company of Andhra Pradesh Limited (APSPDCL), as the case may be;

(l) **'Forecasting Tools'** for the purposes of this regulation include Data Telemetry, Communication System and Data Acquisition System for transfer of information to SLDC and appropriate meters for energy accounting;

(m) **'gaming'** in relation to this regulation, shall mean an intentional mis-declaration of available capacity or schedule by any seller in order to make an undue commercial gain through deviation charges;

(n) **'Grid'** means transmission network of APTRANSCO and distribution network of DISCOMs;

(o) **'interface meters'** means interface meters as defined by the Central Electricity Authority under the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006;

(p) **'pooling station'** means the sub-station where pooling of generation of individual wind or solar generators is done for interfacing with the APTRANSCO / DISCOM Sub-station:

Provided that where there is no separate pooling station for a wind / solar generator and the generating station is connected through common / dedicated feeder and terminated at a sub-station of APTRANSCO/ DISCOM, the sub-station of APTRANSCO / DISCOM shall be considered as the pooling station for such wind / solar generator, as the case may be;

(q) **'Qualified Coordinating Agency or QCA'** means the mutually agreed agency registered with SLDC, to act as a coordinating agency on behalf of wind or solar generators connected to a pooling station and one of such generators can also be such agency;

(r) '**scheduled generation'** at any time or for a time block or any period means schedule of generation in MW or MWh ex-bus;

(s) **'seller'** means a person, including a generating station, either selling power to DISCOM or supplying electricity for captive use or through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access;

(t) **'State'** means the State of Andhra Pradesh;

(u) **'State Grid Code'** means the Andhra Pradesh Code of Technical Interface (Grid Code), 2001 approved by the Commission vide proceedings No. APERC / Dir-Engg. / Grid Code / 20, dated 26-05-2001 under the Andhra Pradesh Electricity Reform Act, 1998 (State Act 30 of 1998);

(v) **'State Entity'** means an entity which is in the SLDC control area and whose metering and energy accounting is done at the State level;

(w) **'SLDC'** or **'State Load Dispatch Centre'** means the centre established under Section 31 of the Act;

(x) **'State Pool Account'** means a separate account to be maintained by SLDC for receipts and payments on account of deviations specified under this regulation;

(y) **'STU'** means the APTRANSCO notified by the State Government as the State Transmission Utility under sub-section (1) of Section 39 of the Act;

(z) '**time-block**' means a time block of fifteen (15) minutes, for which specified electrical parameters and quantities are recorded by special energy meter, with first time block starting at 00:00 hrs;

(aa) **'Virtual Pool'** means the virtual grouping of various pooling stations wherein the generators in such pooling stations have an option for accounting their deviations in an aggregated / combined manner through a QCA for the purpose of availing the benefit of larger geographical area and diversity.

2.2 Save as aforesaid and unless repugnant to the context or the subject-matter otherwise requires, words and expressions used in this Regulation and not defined, but defined in the Act, or the Andhra Pradesh Electricity Reform Act, 1998 (State Act 30 of 1998), or the rules, or the regulations made thereunder or the State Grid Code shall have the meanings assigned to them respectively therein.

3. GENERAL

3.1 Objective

The objective of this regulation is to facilitate large-scale grid integration of solar and wind generating stations while maintaining grid stability and security as envisaged under the State Grid Code through forecasting, scheduling and deviation settlement of these generators.

3.2 Applicability

This Regulation is applicable to all wind and solar generators connected to the Grid, including those connected through pooling stations and supplying power to the

DISCOMs, or to third parties through open access or for captive consumption through open access, and selling power within or outside the State.

4. FORECASTING AND SCHEDULING

4.1 The methodology for day-ahead scheduling of wind and solar energy generating stations which are connected to the Grid and re-scheduling them on one and half hourly basis, and the methodology of handling deviations of such wind and solar energy generating stations shall be as stated hereunder and accordingly Forecasting Tools shall be provided by the generator concerned.

4.2 (a) Wind and Solar generators, either by themselves or represented by Qualified Coordinating Agencies or QCAs, shall provide to the SLDC the technical specifications of the generating units and all other associated equipment of the wind / solar farm, in such format as may be prescribed by the SLDC, by the first (1^{st}) day of January, 2018 or the date of Commercial Operation, as the case may be and thereafter, whenever there is any change in such technical specifications.

(b) The data relating to power generation parameters and weather related data as applicable shall also be provided by the generators concerned to the SLDC in real time, thereafter.

(c) The SLDC shall give appropriate directions under sub-section (1) of Section 33 of the Act, in consonance with this Regulation about the information required on technical specifications and protocol for sharing information on or before the first (1^{st}) day of December, 2017.

4.3 Forecasting shall be done by every wind and solar generator connected to the Grid, either by itself or by a QCA on its behalf. The SLDC shall also undertake forecasting of wind and solar power that is expected to be injected into the Grid with the objective of ensuring secure Grid operation by planning for the requisite balancing resources. The forecast by a wind or solar generator or the QCA, as the case may be, shall be provided separately for each Pooling station. The wind or solar generator or QCA will have the option of accepting the SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on its own forecast. Each QCA shall coordinate the aggregation of schedules of all its generators connected to a pooling station and communicate the same to the SLDC.

4.4 Every wind and solar generator or a QCA shall submit a day-ahead and week-ahead schedule for each generating station or each pooling station, as the case may be. Day-ahead schedule shall contain wind or solar energy generation schedule at intervals of fifteen (15) minutes time-block for the next day, starting from 00:00 hours of the day, and prepared for all ninety six (96) time-blocks. Week-ahead schedule shall contain the same information for the next seven days:

Provided that the wind and solar generators, as the case may be, having multiple transactions under a Power Purchase Agreement and intra-state and / or inter-state Open Access with a common interface meter shall submit schedules with respect to such approved capacities allocated and such capacities alone shall be treated as AvCs for the purpose of these transactions under this Regulation.

4.5 (a) The Schedule of wind and solar generators connected to the Grid, excluding collective transactions, may be revised by giving advance notice to the SLDC. Such revisions shall be effective from the fourth (4^{th}) time block, the first being the time-block in which notice was given.

(b) In respect of wind generators, there may be one revision for each time slot of one and half hours starting from 00:00 hours of a particular day subject to a maximum of sixteen (16) revisions during the day.

(c) In respect of solar generators, there may be one revision for each time slot of one and half hours starting from 5:30 hours upto 19:00 hours of a particular day subject to a maximum of nine (9) revisions during the day.

4.6 The SLDC shall give appropriate directions under sub-section (1) of Section 33 of the Act, in consonance with this Regulation about the Forecasting Tools, alternative means of communication in case of telemetry or other equipment failure, formats of forecast submission and other details on or before the first (1^{st}) day of December, 2017.

4.7 Any commercial impact on account of deviation from schedule based on the forecast shall be borne by the wind or solar generator either by itself or through the representing QCA.

4.8 (a) A wind or solar generating station which is already in commercial operation as on the date of commencement of this Regulation or which may commence its

commercial operation before the first (1^{st}) of January, 2018 shall establish the Forecasting Tools either by itself or through a QCA by the first (1^{st}) day of January, 2018.

(b) A wind or solar generating station commencing commercial operation on or after the first (1^{st}) day of January, 2018 shall not be allowed to be commissioned unless it has established the Forecasting Tools either by itself or through a QCA.

5. ROLE OF QCA

5.1 QCA shall be the single point of contact with SLDC on behalf of its coordinated generator(s) connected to a pooling station for the following purposes:

(i) providing schedules with periodic revisions on behalf of the Wind / Solar generators.

(ii) coordinating with DISCOM / STU / SLDC for metering, data collection, communication and issuance of instructions for despatch / curtailment.

(iii) undertaking commercial settlement on behalf of the generators pertaining to generation deviations including payment of deviation charges to the State Pool Account.

(iv) undertaking de-pooling of payments received on behalf of the generators from the State Pool Account and settling them with the individual generators.

(v) undertaking commercial settlement of any other charges on behalf of the generators connected to a pooling station, as may be mandated from time to time.

(vi) all other ancillary and incidental matters.

5.2 The SLDC shall give appropriate directions under sub-section (1) of Section 33 of the Act in consonance with this Regulation about the guidelines for registration of QCAs, the data / information to be exchanged between the QCA, SLDC and the generator, the protocol for sharing the same etc., on or before the first (1^{st}) day of December, 2017.

6. ENERGY ACCOUNT AND DEVIATION SETTLEMENT

6.1 Energy accounting and payment for the energy generated to the wind and solar generators connected to the Grid shall be in accordance with the procedures prescribed and specified therefor.

6.2 A wind or solar generator or a QCA, as the case may be, shall have the option of accepting the SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on its own forecast, and such schedule shall be used as reference for deviation settlement.

6.3 In the event of actual injection of a generating station or a pooling station, as the case may be, being less or more than the scheduled generation, the deviation charges for shortfall or excess generation shall be payable by the Wind or Solar generator or QCA, as the case may be, to the State Pool Account, as per the Table below:

Table: Deviation Charges in case of under or over-injection, for sale / supply of power within the State

S. No.	Absolute Error in the 15 min. time block	Deviation Charges payable to State Pool Account
1	≤ 15%	None
2	>15 % but ≤ 25%	At Rs. 0.50 per unit for the shortfall or excess energy for absolute error beyond 15% and up to 25%
3	>25% but ≤ 35%	At Rs. 0.50 per unit for the shortfall or excess energy for absolute error beyond 15% and up to 25% + Rs. 1.0 per unit for balance energy beyond 25% and up to 35%
4	> 35 %	At Rs. 0.50 per unit for the shortfall or excess energy for absolute error beyond 15% and up to 25%+ Rs. 1.0 per unit for balance energy beyond 25% and up to 35% + Rs. 1.50 per unit for balance energy beyond 35%

6.4 The deviation charges for under or over injection by wind or solar generators connected to the Grid and supplying power outside the State shall be payable or receivable as per the **Appendix – I**. The accounting for this purpose shall be done by the SLDC.

6.5 Deviations for Inter-State and Intra-State transactions at Pooling Station shall be accounted for separately.

6.6 The SLDC shall provide separate Energy and Deviation accounts for inter-State and intra-State transactions to QCA or the wind or solar generators.

6.7 QCA shall separately settle Deviation Charges with Wind or Solar Generators for inter-State and intra-State transactions.

6.8 QCA shall also de-pool energy deviations as well as deviation charges to each of the generators connected to the pool. The de-pooling of the energy deviations at the pooling station amongst different generators connected to the pool can be apportioned on the basis of the deviations of each generator.

6.9 In order to aggregate the forecasting and scheduling of different pooling stations to avail the benefit of larger geographical area and diversity, a QCA in agreement with the generators in different pooling stations shall have the freedom to go for the option of Virtual Pool. Under a 'Virtual Pool', the declaration of the availability / schedule in respect of the generators shall be made available pooling station wise to SLDC, in order to maintain the sanctity of a control area. However, while computing the deviations, they shall be considered as a combined pool and the QCA shall be responsible for de-pooling the deviations, first amongst the different pooling stations and then amongst the different generators of the respective pooling station.

6.10 The SLDC shall maintain all necessary and required records, registers and accounts in respect of forecasting, scheduling and deviation settlement in accordance with this Regulation.

6.11 The SLDC shall give appropriate directions under sub-section (1) of Section 33 of the Act in consonance with this Regulation on the manner of making the State Pool Account settlement and dealing with the default in respect of the same; the manner of de-pooling of energy deviations and deviation charges, operation of virtual pool and State Pool Account on or before the first (1^{st}) day of December, 2017.

6.12 APTRANSCO being the STU operating the SLDC under the first proviso to sub-section (2) of Section 31 of the Act, shall provide required manpower, funds and infrastructure to the SLDC for due implementation of this Regulation.

7. REPEAL

The second proviso to clause 4.1 of the Andhra Pradesh Electricity Regulatory Commission (Interim Balancing and Settlement Code) Regulation, 2006 (Regulation 2 of 2006) shall hereby stand repealed in so far as it relates to the wind based and solar based open access generators.

8. POWER TO ISSUE DIRECTIONS

If any difficulty arises in giving effect to this Regulation, the Commission may on its own motion or on an application filed by any affected party, issue such directions as may be considered necessary in furtherance of the objective and purpose of this Regulation.

(By Order of the Commission)

Hyderabad,
21.08.2017.

Dr. A . SRINIVAS,
Secretary (I/c).

APPENDIX – I

Framework for deviation charges for under or over injection by wind or solar generators connected to the Grid and supplying power outside the State.

The energy supplied by wind or solar generators outside the State boundary and connected to the Grid shall be settled as per Scheduled Generation.

a) In the event of actual injection being less than the scheduled generation, the deviation charges for shortfall in generation shall be payable by such wind or solar generators, or the QCA on their behalf, as the case may be, to the State Pool Account as given in Table - 1 below:

Table - I: Deviation Charges in case of under injection

S. No.	Absolute Error in the 15 minute time block	Deviation Charges payable to State Pool Account
1	≤ 15 %	At the Fixed Rate for the shortfall energy for absolute error up to 15%
2	>15% but ≤ 25%	At the Fixed Rate for the shortfall energy for absolute error up to 15% +110% of Fixed Rate for balance energy beyond 15% and upto 25%
3	>25% but ≤ 35%	At the Fixed Rate for the shortfall energy for absolute error upto 15% + 110% of the Fixed Rate for balance energy beyond 15% and upto 25% +120% of the Fixed Rate for balance energy beyond 25% and upto 35%
4	> 35%	At the Fixed Rate for the shortfall energy for absolute error upto 15%+ 110% of the Fixed Rate for balance energy beyond 15% and upto 25%+ 120% of the Fixed Rate for balance energy beyond 25% and upto 35%+ 130% of the Fixed Rate for balance energy beyond 35%

b) In the event of actual generation being more than the scheduled generation, the Deviation Charges for excess generation shall be payable to the wind or solar generators, or to the QCA, as the case may be, from the State Pool Account as given in Table - II below:

Table - II: Deviation Charges in case of over injection

S. No.	Absolute Error in the 15 minute time block	Deviation Charges payable to wind or solar generator
1	≤ 15 %	At the Fixed Rate for excess energy up to 15%
2	> 15% but ≤ 25%	At the Fixed Rate for excess energy up to 15% +90% of Fixed Rate for excess energy beyond 15% and upto 25%
3	> 25% but ≤ 35%	At the Fixed Rate for the excess energy upto 15% + 90% of the Fixed Rate for excess energy beyond 15% and upto 25% +80% of the Fixed Rate for excess energy beyond 25% and upto 35%
4	> 35%	At the Fixed Rate for excess energy upto 15%+ 90% of the Fixed Rate for balance energy beyond 15% and upto 25%+ 80% of the Fixed Rate for excess energy beyond 25% and upto 35%+ 70% of the Fixed Rate for excess energy beyond 35%

Note: The Fixed Rate in Tables-I and II above shall be the Power Purchase Agreement (PPA) rate as determined by the Appropriate Commission under section 62 of the Act or the rate adopted by the Appropriate Commission under section 63 of the Act. In case of multiple PPAs, the weighted average of the PPA rates shall be taken as the Fixed Rate. The wind and solar generators shall furnish the PPA rates on affidavit to the SLDC, supported by a copy of the PPA, for the purpose of Deviation charge account preparation.

Fixed Rate for Open Access participants selling power which is not accounted for Renewable Purchase Obligation compliance of the buyer, and the captive wind or solar plants shall be the Average Power Purchase Cost (APPC) rate at the national level, as determined by the CERC from time to time.

c) With reference to clauses (a) and (b) as above, for balancing of deemed Renewable Purchase Obligation (RPO) compliance of buyers with respect to schedule, deviations by all wind and solar generators which are selling power outside the State boundary shall first be netted off for the entire pool on a monthly basis and any remaining shortfall in renewable energy generation must be balanced through purchase of equivalent solar and non-solar Renewable Energy Certificates (RECs), as the case may be, by SLDC by utilising funds from the State Pool Account. For positive balance of renewable energy generation, equivalent notional RECs shall be credited to the State Pool Account and carried forward for settlement in future.

(d) The Commission, either suo-motu or on a petition made by SLDC, or any affected party, may initiate proceedings against any generating company or seller on charges of gaming and if required, may order an inquiry in such manner as decided by the Commission. When the charge of gaming is established in the above inquiry, the Commission may, without prejudice to any other action under the Act or Regulations there under, disallow any Charges for Deviation received by such generating company or the seller during the period of such gaming.

(By Order of the Commission)

Hyderabad,
21.08.2017.

Dr. A . SRINIVAS,
Secretary (I/c).

---x---

Published and Uploaded by the Commissioner of Printing, Government of Andhra Pradesh at Government Regional Press, Vijayawada, www.ap.egazette.cgg.gov.in